

[54] DENTAL FLOSS HOLDER

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[22] Filed: Apr. 5, 1974

[21] Appl. No.: 458,324

[52] U.S. Cl. 132/91

[51] Int. Cl.² A61C 15/00

[58] Field of Search 132/91, 89, 92 R, 92 A

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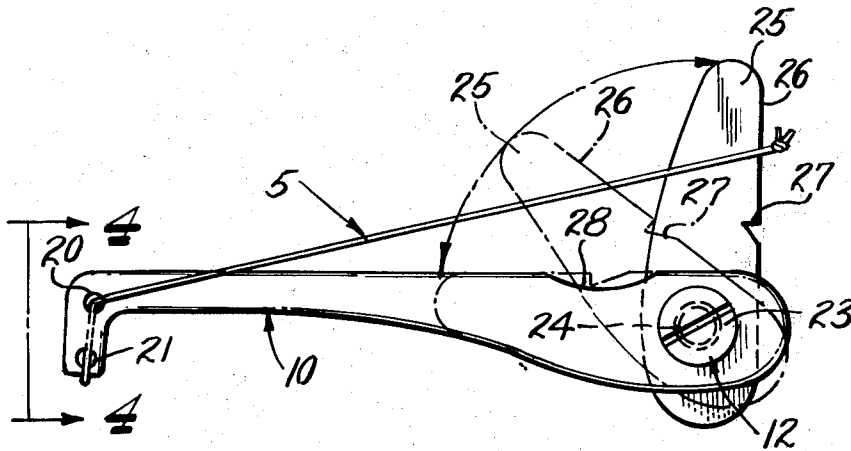
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[57] ABSTRACT

A dental floss holder includes a pair of elongated, independently pivotable leg elements and a floss tension adjusting lever. The leg elements have floss retaining means at their ends, and are independently manipulable about a horizontal, transverse axis and vertical axes to enable continuous adjustment of the floss tension and to enable guidance of the floss in a desired manner between the teeth of a user.

12 Claims, 5 Drawing Figures



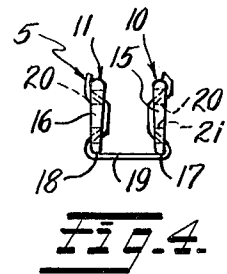
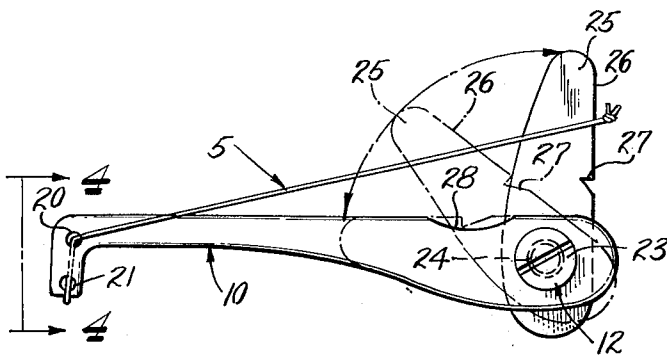
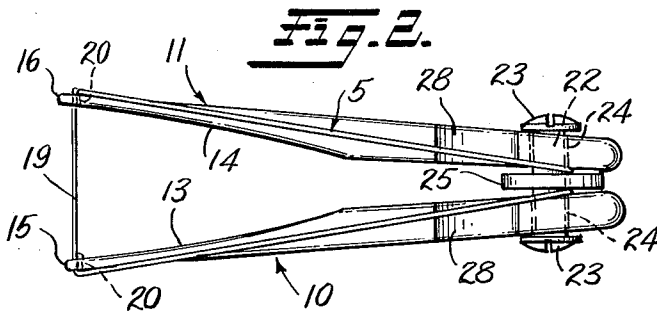
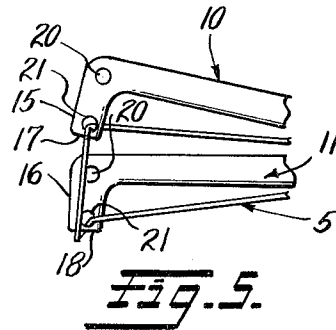
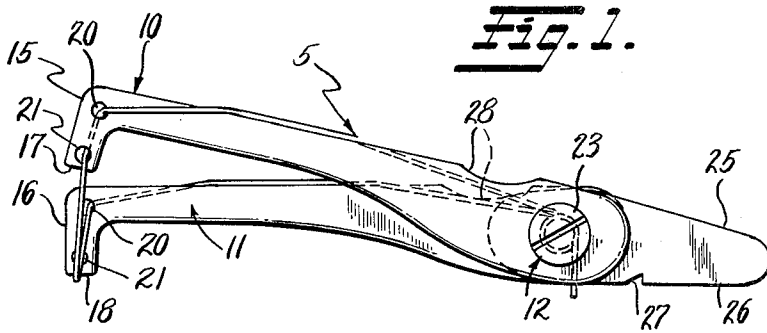


Fig. 3.

DENTAL FLOSS HOLDER**BACKGROUND OF THE INVENTION**

Dental floss holders in various forms have been known in the art for many years. Their utility and convenience as an aid for the removal of food particles from between the teeth of a user need no elaboration. In the absence of a holder, one's fingers must be used for holding the floss and this can be difficult for some individuals, particularly elderly or arthritic people, and children. Also, a holder is a handy utensil for dentists and dental hygienists for use in cleaning patients' teeth.

Desirable characteristics of a dental floss holder include simplicity, low cost, ease of cleaning, and, in some instances, disposability. Other important characteristics include ease of manipulation, maneuverability in the mouth, and simple regulation of the tension of the floss cleaning strand material.

Prior art floss holders include those shown in the following patents that are known to applicant: Goodrich U.S. Pat. No. 1,364,367; Rodesei U.S. Pat. No. 2,650,598; Stewart U.S. Pat. No. 2,828,754; Storm U.S. Pat. No. 2,059,287; Gjerde U.S. Pat. No. 2,873,749; Thompson U.S. Pat. No. 3,642,011; Brockman U.S. Pat. No. 3,236,247; and Espinosa U.S. Pat. No. 3,631,869.

SUMMARY OF THE INVENTION

The present invention is believed to provide a distinct and unique improvement in the dental floss holder art. The present invention provides a floss holder that is extremely simple, inexpensive to produce, very maneuverable in the mouth, and easy to handle by anyone.

In essence, the floss holder of the present invention includes a pair of elongated floss holding leg elements that can be manipulated independently up and down and side to side so that the working area of floss stretched between the legs can be maneuvered in an extremely flexible and precise manner by simple fingertip manipulations.

In addition, the tension of the floss strand stretched between the legs of the holder can be continuously and selectively varied by fingertip motion through a simple tension adjusting lever provided on the dental floss holder, or, alternatively, the lever may be pivoted to a position where it merely secures the floss loop to the holder with suitable pre-tension.

The ends of the legs of the holder are furthermore each provided with a pair of floss retaining apertures for enabling a loop of floss to be quickly threaded on the holder and secured thereto with virtually no floss being unavailable for ultimate use in teeth cleaning. The floss loop can simply be rotated on the holder so a worn section is transferred to an inactive section of the loop when a new area is brought to the working section of the holder.

With the above general considerations in mind, reference is made to the attached drawings which show a preferred embodiment of the present invention and the detailed description of the preferred embodiment which appears below.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side elevation view of the floss holder of this invention with a loop of dental floss threaded thereon;

FIG. 2 is a top plan view of the holder with the floss loop;

FIG. 3 is a side elevation of the floss holder showing how the floss loop length is measured and the floss tension regulated;

FIG. 4 is an end view taken along lines 4—4 of FIG. 3 and shows the floss holder legs in their normal functioning position after the tension lever has been adjusted; and

FIG. 5 shows an alternate floss looping arrangement.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

With reference to the drawings, and in particular FIGS. 1, 2, and 3, a holder for dental floss 5 includes left and right elongated, floss holding leg elements 10 and 11, respectively, connected together for relative pivotal motion by a hinge member 12.

The leg elements 10 and 11 may be tapered toward their distal ends as shown at 13 and 14 and may be formed, preferably, from flat stock or molded plastic material. The distal ends 15, 16 of the leg elements are preferably turned down as illustrated to provide working edges or ends 17, 18 across which the working length of the dental floss 19 is to be stretched.

For retaining the floss, the distal ends 15, 16 are each provided with a pair of apertures, one above the other, for reasons that will be made clear in the ensuing description.

The specific configuration of the distal ends of the leg elements, of course, can be modified within the scope of this invention to accommodate various manufacturing and use requirements, the illustrated form being only a presently preferred embodiment which has been successfully used in practice. Likewise, the floss retaining apertures 20, 21 illustrated could be altered to accommodate a different configuration of the distal ends of the leg elements. It has been found that the illustrated arrangement is particularly effective, however, for use with the distal end configuration shown in the drawings.

Towards the rearward ends of the leg elements 10, 11 the leg elements are interconnected by, according to the preferred embodiment, a double headed hinge pin assembly 12 including a transversely extending pin 22 and opposed enlarged head portions 23 secured to opposite ends of the pin 22 and which may be parts of a suitable separable fastener assembly. The pin 22 fits within an aperture 24 in each leg element 10, 11, the aperture 24 being slightly larger than the pin member 22 so that each leg element 10, 11 can independently pivot in a generally vertical plane about the longitudinal axis of the pin 22 so as to enable movement of the distal ends 15, 16 in an up and down manner. As illustrated, the pin 22 extends in a transverse direction with respect to the elongated leg elements 10, 11.

Each leg element, by reason of the enlarged aperture 24 can also pivot side to side about a generally vertical axis extending generally normal to the longitudinal axis of the pin 22 so that the distal ends of the leg elements 10, 11 can move from side to side in a generally horizontal direction. Of course, it is envisioned that only one of the leg elements 10 or 11 could be provided with an enlarged aperture 24 which would still enable each of the leg elements to pivot up and down and transversely with respect to each other. Thus, the loose pin to leg connection enables both up and down and side

to side motion of the floss retaining ends of the leg elements. The purpose of this freedom of motion will become clear as this description continues.

It should be observed that the hinge means 12 disclosed and shown in the drawings is one embodiment that has been selected among numerous alternatives contemplated within the scope of the present invention. The essential requirement for the hinge 12 is that the leg elements must be able to swing towards and away from each other at their distal ends and up and down independently. Clearly any hinge arrangement which permits this without adverse reaction forces being set up in the hand of the manipulator could be utilized. A simple, integrally bent set of tines as shown in certain prior art embodiments is not considered to embody the spirit of this invention which features a distinct hinge element which permits free and independent movement of both of the leg elements with respect to each other, the movement of one not imposing any reaction forces on the other when the first is pivoted. When the floss holder is to be manipulated by the fingers and thumb of a single hand of a user, the absence of reaction forces is an important and distinct advantage, and most nearly presents to the user the motions and forces encountered by simply manipulating the floss itself manually.

Various hinge arrangements could be utilized in this invention that are not shown in the drawings, even, for example, a hinge located beyond the right hand ends of the leg elements as view in FIGS. 2 and 3. Also not shown is the concept that a portion of the hinge could be integrally formed with one of the leg elements with an enlarged aperture provided in the other leg element, or the headed portions could be snap-on sections or interference fit enlargements over which the leg elements could be snapped on or off. Numerous such configurations can be envisioned within the scope of the present invention and it is not intended to limit the scope of this invention in any manner beyond the language of the appended claims by this description of a single configuration of a hinge arrangement.

Disposed between the hinged ends of legs 10, 11, a floss tension control and securing lever 25 is pivotally connected to hinge pin 22 for pivotal movement about the longitudinal axis of pin 22 (that is, about a transverse horizontal axis). The lever 25 is fully pivotable about the pin 22 as shown schematically in FIG. 3. It is shown as being formed from flat stock material but clearly could be molded or configured in any suitable form which would enable the function of the lever to be carried out.

The floss loop 5 is measured as shown in FIG. 4. Starting from a point along the rearward edge 26 of lever 25 as shown in FIG. 4, the floss strand is strung to the upper floss retaining aperture 20 of either leg 10 or 11. Assuming it is first strung to leg 10, with the initial positions of legs 10 and 11 being as shown in FIG. 3, the strand is threaded inwardly through hole 20, down the inside of leg 10 (see FIG. 4), out through lower opening 21 in leg 10, down and around the bottom edge 17 of distal end 15, across to the bottom edge 18 of distal end 16, around the edge 18 and inwardly through lower hole 21 in end 16, up and out through upper hole 20 in end 16, and finally back to the rearward edge 26 of lever 25 from the other direction. The loop is knotted or otherwise secured at the rearward edge of lever 25 (the floss loops could be provided in

pre-formed loops if desired) and the lever is pivoted clockwise as illustrated in FIG. 1 or entirely around back to a position where it lies between the legs 10 and 11, or anywhere in between where it is convenient to handle. The loop 5 is engaged and retained by a lip 27 or other floss keeping or retaining configuration provided at the rear edge of lever 25 so it does not slip up and over the top of the lever during the initial tensioning of the floss.

Rotation of lever 25 clockwise as seen in FIG. 1 causes tension to be applied to the floss loop 5, causing the distal ends 15, 16 to be drawn towards each other so that the final spacing between the legs 10, 11 will appear somewhat as shown in FIG. 4. The lever is prevented from swinging back to the untensioned position by a finger of the hand of the user, or will be substantially free of reaction forces tending to rotate the lever counterclockwise if the lever is first rotated fully clockwise back to a position where it lies between the legs 10, 11, with the floss wrapped around the pin 22.

Each leg element 10, 11 is preferably provided with a finger gripping surface 28 on its top edge as shown in FIGS. 1, 2 and 3, and may even be provided with a grip assisting surface on its bottom edge area opposite the surface 28 (not shown).

In use, the floss loop is measured if necessary, threaded through apertures 20, 21 and looped around to the back edge of lever 25 where it is knotted, if necessary, before lever 25 is rotated around to hold the entire assembly in its operative relationship. The holder is then gripped by grasping leg elements 10, 11 together between forefinger and thumb, with another finger, i.e., middle or ring or both, resting comfortably on the top edge of the lever 25 if it is in its partially rotated position as shown in FIG. 1, for example. The distal ends of legs 10, 11 are also held separated by finger and thumb action to secure a working tension on the working length 19 of floss 5 disposed between the distal ends 15, 16 of legs 10 and 11, respectively. The unique hinge arrangement of this invention permits independent up and down motion of the distal ends 15 and 16 in the manner described above.

Thus, by reason of the structure embodying the present invention, the working length 19 of floss 5 disposed between the distal ends 15, 16 of legs 10 and 11 may be varied in length, tension, and angularity during its use. The finger(s) of the user on lever 25 can constantly adjust the total length and tension available of the working length 19 of the floss, while the finger(s) and thumb grasping the legs 10, 11 in the opposed areas at 28 on the legs can vary the final tension in 19 and the relative vertical positions of the ends 15, 16 of legs 10, 11.

It will be readily apparent that the loop 5 can be shifted around to present a new working length 19 between ends 15, 16 at any desired time.

While the threading arrangement shown in FIGS. 1-4 has been illustrated and found to work in a quite satisfactory manner, the invention contemplates other threading procedures that also will function properly. For example, as shown in FIG. 5, where the relative position of legs 10 and 11 has been reversed from that shown in FIG. 1, the floss could be threaded directly outwardly through lower aperture 21 in leg 10, wrapped around the bottom edge of end 15 and across to the bottom edge of end 16 of leg 11, around the out-

side of end 16 and inwardly through aperture 21 in end 16, and from there directly back to the lever 25.

Having thus described a preferred embodiment, I Claim:

1. A dental floss holder comprising a pair of relatively rigid elongated leg elements and a hinge means; each leg element being pivotally connected adjacent one end thereof to said hinge means; a pivotal connection between said hinge means and each of said leg elements for permitting said leg elements to be independently and freely pivoted with respect to each other about at least a pair of mutually orthogonal axes; and dental floss retaining means at the distal ends of said leg elements.

2. A dental floss holder comprising a pair of elongated, relatively rigid leg elements and a transversely extending hinge pin means; each leg element being pivotally connected at one end thereof to said hinge pin means in close-spaced relationship with respect to the other leg element; pivotal connection means between said leg elements and said hinge pin means enabling each of said leg elements to independently and freely pivot about a pair of pivotal axes including a first axis extending coincidentally with the longitudinal axis of said hinge pin means and a second axis extending normal to said first axis; dental floss retaining means at the distal end areas of each of said leg elements; and means for retaining said leg elements pivotally connected to said hinge pin means.

3. The dental floss holder of claim 2 further including a length of dental floss extending between said dental floss retaining means, the tension in said length of floss as well as its angular disposition relative to the longitudinal axis of said hinge pin means being controllable by pivotal movement of said leg elements with respect to each other about said pivotal axes.

4. The dental floss holder recited in claim 2, further wherein said pivotal connection means includes a loose joint connection between said leg elements and said hinge pin means, said connection comprising an aperture in said leg elements greater in size than the largest transverse cross-sectional dimension of said hinge pin means, said hinge pin means extending through the apertures in said leg elements.

5. A dental floss holder assembly comprising: a pair of elongated leg elements; hinge means extending between and connecting together said leg elements adjacent one end of each leg element, said hinge means enabling independent, pivotal movement of said leg elements with respect to each other about a transverse, horizontal axis; dental floss retaining means at the distal end areas of said leg elements; said hinge means being connected to at least one of said leg elements by a joint connection which permits said one leg element to independently pivot about a generally vertical axis with respect to said transverse, horizontal axis and said movement of said one leg element in either direction about said vertical axis causing movement of its respective distal end towards and away from the distal end of the other leg element in a transverse plane including said horizontal axis and the distal ends of said leg elements; and movement of either leg element with respect to the other about said horizontal axis causing generally vertical movement of its respective distal end with respect to the distal end of the other said leg elements, whereby the tension of a length of dental floss retained between said distal ends may be varied by

movement of at least one of said leg elements about said vertical axis with respect to the other leg element, and such length of floss may also be inclined relative to a transverse, horizontal plane including said horizontal axis by movement of either of said leg elements with respect to the other leg element about said horizontal axis.

6. The dental floss holder assembly recited in claim 5 further including a floss tension and winding lever pivotally attached to said hinge means intermediate said leg elements and rotatable completely about said hinge means in a vertical plane extending transversely of said horizontal axis.

7. The dental floss holder of claim 5 wherein said hinge means is a generally cylindrical, transversely extending pin member having an outer diameter, and at least one of said leg elements includes an aperture for receiving said pin member, said aperture having an internal diameter slightly greater than said pin member outer diameter, whereby said one leg element may independently pivot about said transverse horizontal and vertical axes, with respect to said other leg element, at least in a limited manner.

8. The dental floss holder of claim 6 wherein the other of said leg elements also includes an aperture for receiving said pin element, the last said aperture likewise having an internal diameter slightly greater than said pin member outer diameter, whereby both of said leg elements may independently pivot with respect to said pin member about transverse horizontal and vertical axes.

9. The dental floss holder of claim 6 wherein each of said distal ends of said leg elements includes a pair of apertures, one above the other, said apertures comprising said dental floss retaining means.

10. A dental floss holder comprising:

A. a pair of elongated leg elements,

1. each leg element having a respective distal dental floss retaining end and a pivotally attached end,
2. said leg elements each tapering inwardly in cross sectional area toward their dental floss retaining ends,
3. each leg element having a downturned, distal end portion having a pair of vertically spaced apertures therein for retaining a length of dental floss;

B. a transversely extending hinge pin means,

1. said leg elements being secured at their pivotally attached ends to said transversely extending hinge pin means through a joint connection permitting independent pivotal movement of said leg elements about a transverse horizontal axis and independent movement of each leg element about a generally vertical axis extending normal to said transverse horizontal axis, and
2. said hinge pin means comprising a separable fastener having opposite head portions, said leg elements being connected to said fastener between said head portions;
- C. an elongated floss tension lever pivotally connected to said hinge pin means and disposed between said leg elements, said lever also being pivotable about a transverse, horizontal axis, and including a floss retaining means in the form of a lip located on the edge of said lever facing away from the distal ends of said leg elements when said lever

is in an upright position normal to the longitudinal axis of said leg elements.

11. The dental floss holder of claim 10, further wherein each of said elements has a gripping indentation on its upper edge adjacent its connection to the said hinge pin means to facilitate non-slip manipulation thereof by a finger of a grasping hand.

12. A teeth cleaning implement comprising:

- A. a pair of elongated leg elements;
- B. hinge means connecting together said leg elements adjacent one end thereof for enabling independent pivotal movement of said leg elements about a transverse, horizontal axis;
- C. dental floss retaining means at the distal ends of said leg elements, said dental floss retaining means comprising a pair of vertically spaced apertures;
- D. an elongated dental floss tension lever pivotally connected at one end for pivotal movement about a transverse, horizontal axis, and disposed between said leg elements adjacent said hinge means, said lever having a rearward edge facing away from said distal ends of said leg elements when said lever is

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in an upright position normal to the longitudinal axis of said leg elements;

E. a loop of dental floss extending from the rearward edge of said lever, to the upper aperture at the distal end of one leg element, inwardly through said upper aperture and downwardly along the inner distal end of said one leg element, outwardly through the lower aperture thereof and around the bottom of the distal end of said one leg element, across the gap between the distal end of said one leg element and the distal end of the other leg element, around the bottom of the distal end of said other leg element and inwardly back through the lower aperture thereof, upwardly along the inner distal end of said other leg element and outwardly through the upper aperture thereof, and back to the rearward edge of said tension lever, whereby the tension of said floss loop can be controlled through manipulation of said lever about its pivotal axis.

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